

Upgrading and Servicing Guide

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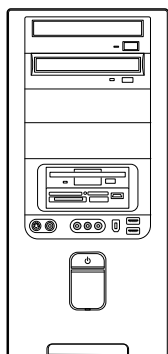
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Safety Information

This product has not been evaluated for connection to an "IT" power system (an AC distribution system with no direct connection to earth, according to IEC 60950).



WARNING: Please read "Safety Information" in your user documentation before installing and connecting your computer to the electrical power system.



Opening and Closing the PC

Preparing the PC

Before you upgrade any component in your PC, you need to prepare the PC so that you can safely handle it and the components.

Read the following items before attempting to upgrade or service the PC:

- These procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.
- Write down and save the PC model and serial numbers, all installed options, and other information about the computer. It is easier to consult the information in this guide than to open and examine the PC.

- We recommend that you use an antistatic wrist strap and a conductive foam pad when working inside the PC.



WARNING: Always disconnect the modem cord from the telephone system, and then disconnect the PC from the power source before removing the front and side panels of the PC. Failure to do so before you open the PC or do any procedures can result in personal injury or equipment damage.

Before Opening the PC

- 1 Remove any diskette (floppy disk), memory card media, or optical disc (CD or DVD) from the PC. The PC power must be on to remove discs.
- 2 Click the **Start** button, and then click **Turn Off Computer**. Click **Turn Off**.
- 3 Disconnect the modem/telephone cable, if present.



CAUTION: To reduce the risk of personal injury from electrical shock or hot surfaces, disconnect the power cord from the wall outlet, and allow the internal system components to cool before you touch them.

- 4 Disconnect the power cord from the electrical outlet and then from the PC.
- 5 Disconnect all other attached cables (such as the keyboard, mouse, and monitor) and all external devices.



CAUTION: Static electricity can damage the electronic components of the PC or optional equipment. Ensure that you are discharged of static electricity by briefly touching a grounded metal object.

After Closing the PC

To avoid injury and equipment damage, always follow this procedure in this order after closing the PC:

- 1 Reconnect the power cord.

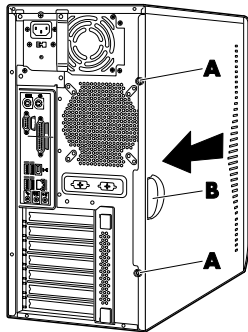


CAUTION: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications or telephone connectors into the network interface card (NIC) (labeled as an Ethernet connector).

- 2 Reconnect the modem/telephone cable and all other cables (such as the keyboard, mouse, and monitor) and external devices.
- 3 Turn on the PC and all peripherals.
- 4 If you installed an add-in card, install any software drivers supplied by the card manufacturer.

Removing the Side Panel

- 1 Loosen the two thumbscrews (A) that secure the panel to the PC chassis.



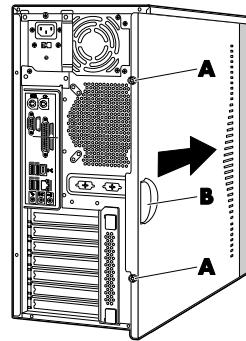
- 2 Pull back the handle (B) to free the panel, and then lift it off the unit.



WARNING: Beware of sharp edges inside the chassis.

Replacing the Side Panel

- 1 Place the side panel on the chassis with the back of the panel extended slightly. Ensure the hooks on the top and bottom of the panel fit into the holes in the chassis. Slide the panel forward into place.

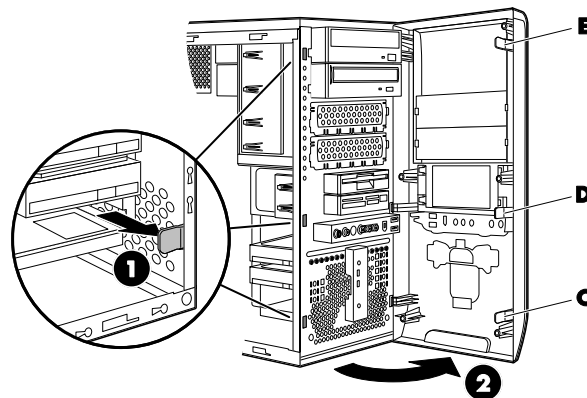


- 2 Tighten the thumbscrews (A).

Removing the Front Panel

This procedure is necessary only when removing or replacing an optical drive, a memory card reader, or a diskette (floppy) drive.

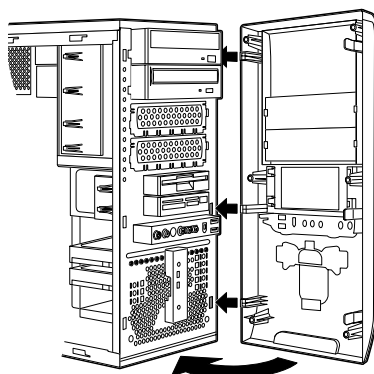
- 1 Press the front panel bottom tab (C) on the inside of the chassis, press the middle tab (D), and then press the top tab (E).



- 2 Swing open the front panel and lift it off the chassis.

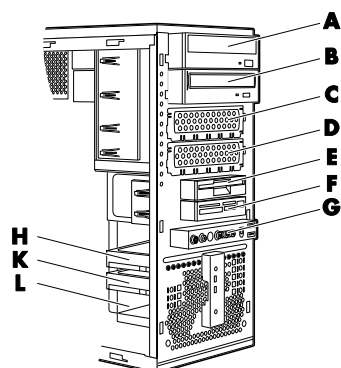
Replacing the Front Panel

- 1 Align the right side of the front panel with the slots on the right side of the chassis front, and press the right side of the front panel into place.



- 2 Swing the front panel closed, and then press the left side of the front panel to latch it into place.

Locating Components Inside the PC



- A** Upper optical drive bay; may be a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, or combination drive.
- B, C, D** Optical drive bay; may be empty (blank plate) or a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, or combination drive.
- E** Diskette (floppy) drive (select models) or may be empty (blank plate).
- F** Memory card reader (select models) or may be empty (blank plate).
- G** Front connector panel (no replacement instructions).
- H** Hard disk drive, primary (with operating system partition).
- K, L** Additional hard disk drives (select models) or may be empty.

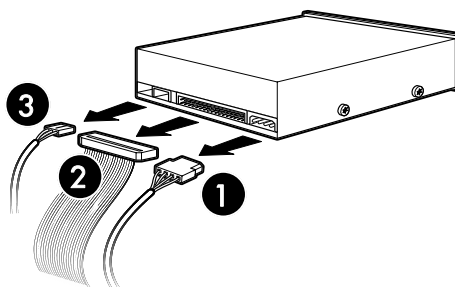
Removing and Replacing Drives

Your PC has several drives that you can replace or upgrade. You can add a drive into an empty drive bay. See the preceding topic, "Locating Components Inside the PC," for drive type and location. For hard disk drives, see "Removing a Hard Disk Drive" on page 5.

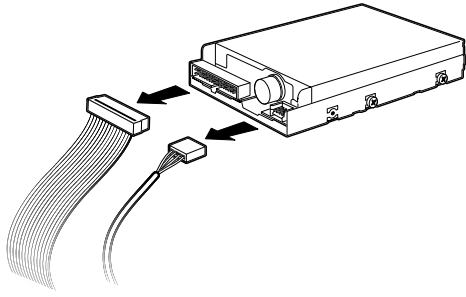
IMPORTANT: Before adding a new diskette drive, memory card reader, optical drive, or hard disk drive, make sure that it is compatible with the Microsoft® Windows® XP operating system. Also, make sure you have the correct software and drivers for the drive to work with the operating system.

Removing a Drive

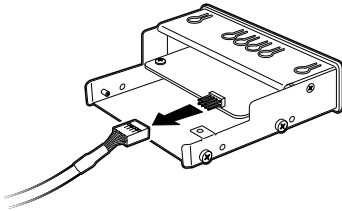
- 1 Complete the procedures to prepare the PC, to remove the side panel, and to remove the front panel. See "Opening and Closing the PC" on page 1.
- 2 Locate the drive you want to remove.
- 3 Disconnect the power cable (1) and data cable (2) from the back of the drive you want to remove, as indicated in the following illustrations. Use a gentle rocking motion. Some units may have a sound cable. If so, disconnect the sound cable (3).



Disconnecting the optical drive cables

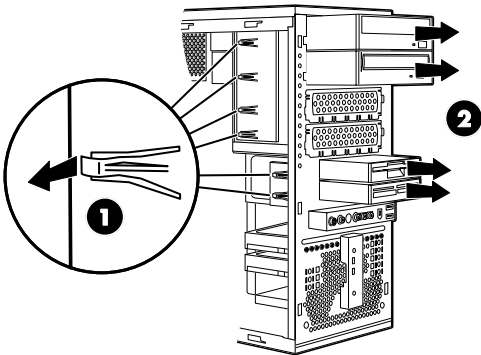


Disconnecting the diskette drive cables



Disconnecting the memory card reader drive cables

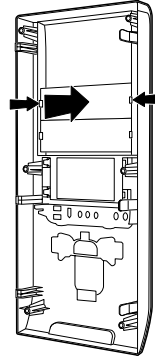
- 4 Release the drive from the chassis by lifting the tab (1) on the latch drive bracket and then sliding (2) the drive forward out of the bay. (The latch drive bracket secures the drives in their respective positions in the chassis.)



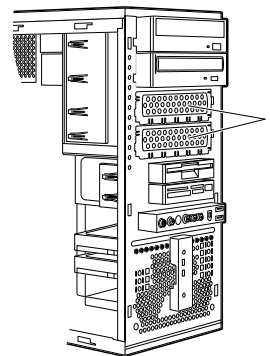
- 5 Pull the drive out of the drive bay.
- 6 If you are replacing the old drive with a new drive, remove the guide screws from the old drive. The optical drives have two screws on each side; the memory card reader and diskette drive have two screws on the left side only. You need these screws to install the new drive.

Replacing or Adding a Drive

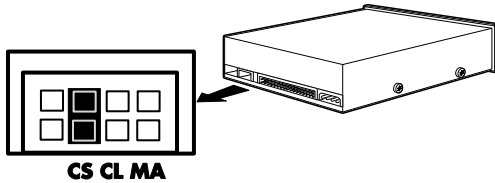
- 1 If necessary, remove the existing drive. See "Removing a Drive" on page 3.
- 2 If you are adding a drive to an empty drive bay:
 - a Remove the blank plate from the front cover by pushing it forward until it snaps out of the cover.



- b Remove the shield (F) from the bay by pulling it out of the chassis. If necessary, insert the tip of a flat screwdriver between the chassis and the shield on the left side and then pry the shield free.

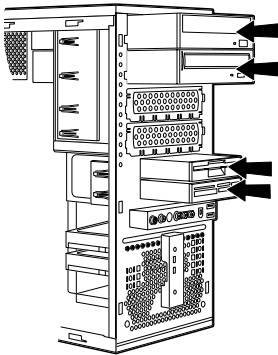


- 3** Make sure the jumper on a new optical drive is in the CS (cable select) position. Your drive may vary from the illustration.

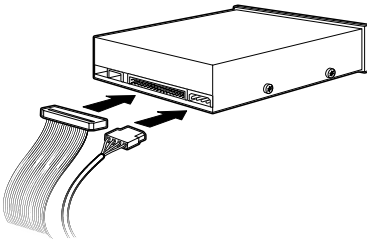


Cable select jumper

- 4** Install the guide screws on the sides of the new drive. (The optical drives have two screws on each side; the memory card reader and diskette drive have two screws on the left side only.) The screws help guide the drive into its proper position in the bay.
- 5** Slide the drive into the drive bay, making sure to align the guide screws with the guide slots. Push the drive all the way into the bay until the drive snaps into place.

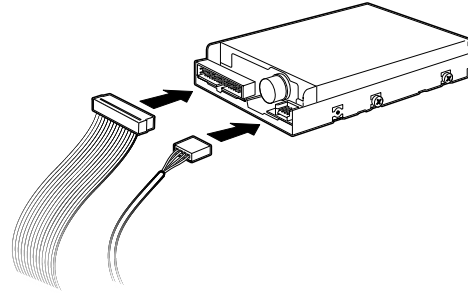


- 6** Reconnect the power and data cables to your drive as indicated in the following illustrations:

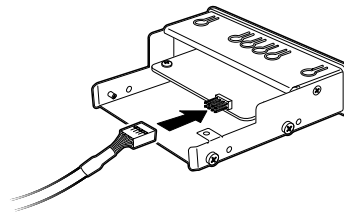


Connecting the optical drive cables

NOTE: An optical drive may include a sound cable. Connect this cable also.



Connecting the diskette drive cables



Connecting the memory card reader drive cables

- 7** Complete the procedures to replace the front panel, replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

Removing a Hard Disk Drive

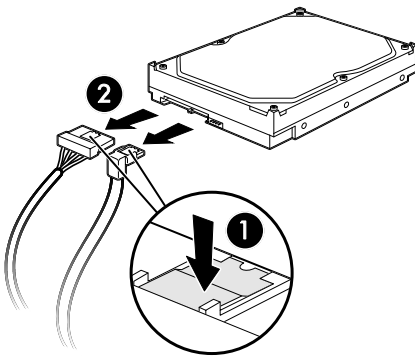
The system hard disk drive is the top drive in the three-drive non-removable cage in the chassis; see item **H** in the figure under "Locating Components Inside the PC" on page 3. The other two slots in the hard disk drive cage are for secondary hard disk drives (select models).

The hard disk drive is either a Serial ATA (advanced technology attachment) drive that uses a narrow data cable, or a Parallel ATA drive that uses a wide data cable.

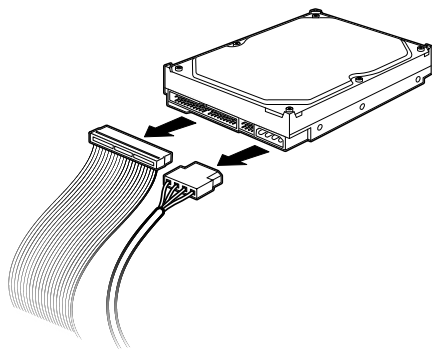


CAUTION: Back up your personal files on the hard disk drive to an external storage device, such as a CD, before removing the hard disk drive. Failure to do so will result in data loss. After replacing the hard disk drive, you need to run System Recovery using the recovery discs to load the factory-installed files.

- 1 Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
- 2 Locate the hard disk drive you want to remove.
- 3 Disconnect the power cable and data cable from the back of the drive you want to remove. For a Serial ATA drive, press the latch (1) in the center of each plug and pull the plug (2) from the drive connector. For a Parallel ATA drive, use a gentle rocking motion to free the plug.

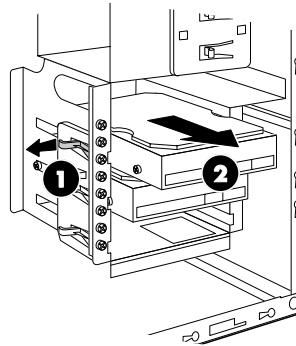


Disconnecting the Serial ATA hard disk drive cables



Disconnecting the Parallel ATA hard disk drive cables

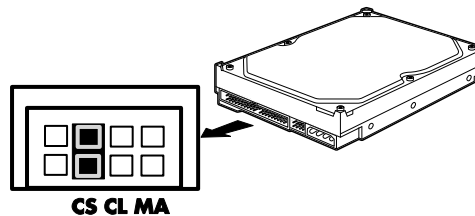
- 4 Release the drive from the cage by lifting the tab (1) on the latch for the hard disk drive cage and then sliding (2) the drive out of the cage. (The latch secures the drive in the cage in the chassis.) Be careful to touch only the sides of the drive.



- 5 If you are replacing the old drive with a new drive, remove the four guide screws (two screws on each side) from the old drive. You need these screws to install the new drive.

Replacing or Adding a Hard Disk Drive

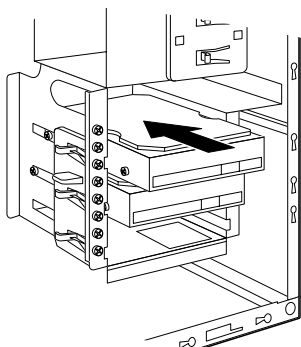
- 1 If necessary, remove the existing drive. See the previous procedure.
- 2 For a Parallel ATA drive, make sure the jumper on the new hard disk drive is in the CS (cable select) position. Your drive may vary from the illustration. The Serial ATA drive does not use cable select.



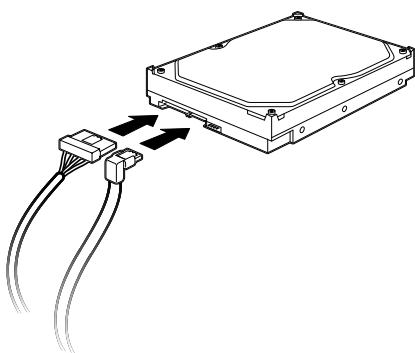
Cable select jumper

- 3 Install four guide screws on the sides of the new drive (two screws on each side). The screws help guide the drive into its proper position in the bay.

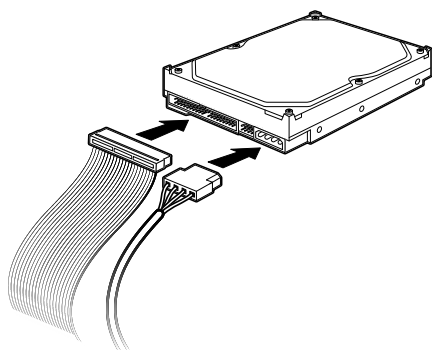
- 4 Slide the drive into the cage, making sure to align the guide screws with the guide slots. Push the drive into the cage and snap it into place.



- 5 Reconnect the power and data cables to the drive.



Connecting the Serial ATA hard disk drive cables



Connecting the Parallel ATA hard disk drive cables



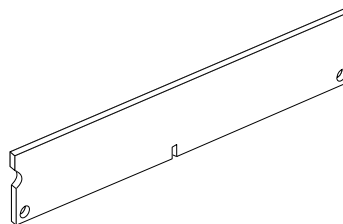
WARNING: For Parallel ATA drives, connect the IDE data cable end labeled **Master** to the primary hard disk drive in the top slot of the hard disk drive cage. If you have a second or third hard disk drive, connect the IDE cable labeled **Slave** to them. If the IDE cable is not connected correctly, the PC will not be able to locate the hard drives and data may be lost.

- 6 Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

Adding Memory

Your PC comes with random access memory (RAM), which temporarily stores data and instructions on your PC. The PC ships with one or more memory modules, but you can replace the existing memory module(s) with higher-capacity ones.

The motherboard contains sockets for DDR DIMMs (double data rate dual in-line memory modules). The exact number of sockets and type of DDR memory module depends on which model PC you have.



DDR DIMM module example

To determine which type of memory module your PC uses, and for specific memory module information and specifications, go to the Web site listed in your *Warranty and Support Guide* and click the Support link.



WARNING: Using the wrong type of memory module can damage the system.

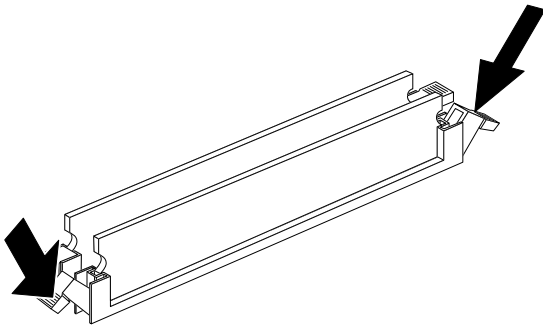
Removing a Memory Module

- 1 Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
- 2 Gently lay the PC on its side.
- 3 Locate the memory module sockets on the motherboard.



CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

- 4 Move any cabling out of the way, if necessary.
- 5 Push down the two retaining clips on the ends of the memory socket until the memory module pops out of the socket.



WARNING: Do not pull the memory module out of the socket. Use the retaining clips to eject the module.

- 6 Lift the memory module from the memory socket.

Installing a Memory Module

Upgrade the memory in your PC with memory of the same type and speed as the memory originally installed in your PC.

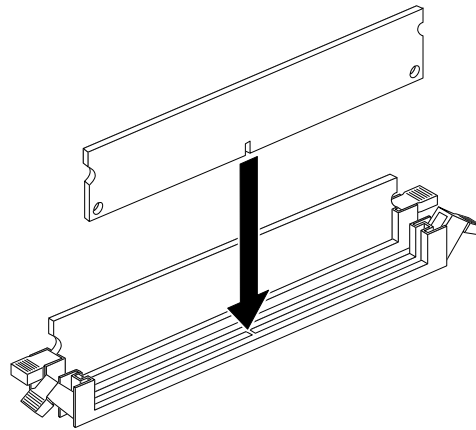


CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

- 1 Open both latches of the memory module socket:
 - If you are *replacing* a memory module, put the new memory module in the same memory slot from which the old memory was removed.

Or

- If you are *adding* a memory module, install the new module into the socket nearest the preinstalled module, and install additional modules in the next available sockets.



- 2 The memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket. Push the module carefully and firmly into the slot, ensuring that the latches on both ends snap into place.
- 3 Set the chassis upright.
- 4 Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

NOTE: If your computer shows a blank screen after you replace or add a memory module, the memory is installed incorrectly, or it is the wrong type of memory. Remove and reinstall the memory module.

Removing or Installing an Add-in Card

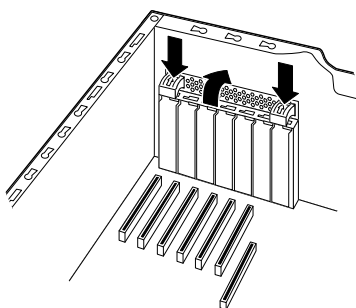
An add-in card is a circuit board, such as a PCI or an AGP card, that fits into a PC add-in card slot. Your PC contains several add-in card slots that can be used to add components to your PC. The PC component configurations vary by model.



WARNING: Do not overload the system by installing add-in cards that draw excessive current. The system is designed to provide 2 amps (average) of +5 V power for each board/card in the computer. The total +5 V current draw in a fully loaded system (one with all add-in card slots filled) must not exceed the total number of slots multiplied by 2 amps.

Removing an Add-in Card

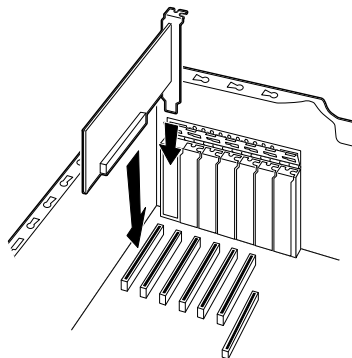
- 1 Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
- 2 Gently lay the PC on its side.
- 3 Inside the PC, locate the add-in card slots on the motherboard.
- 4 Release the latch that retains the cards by pressing the two tabs at the top of the add-in slots inside the chassis.



- 5 Holding the card at each end, carefully rock it back and forth until the connectors pull free from the socket, and then remove the card. Be sure not to scrape the card against the other components. Store the old card in the anti-static packaging that contained your new card.
- 6 If you are not replacing the old add-in card with a new add-in card, close the open slot by inserting the metal slot cover into the opened slot.

Installing an Add-in Card

- 1 Align the edge of the add-in card with the slot on the chassis and gently but firmly press the card straight down into the add-in card slot. The whole connector should be seated properly in the card slot.



- 2 Replace the latch by pressing in on the square tabs on the outside of the chassis. The latch should move down so that it locks into position over the cards. If it does not latch, check that each card is completely seated into its card slot.
- 3 Set the chassis upright.
- 4 Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

NOTE: If the new card or device isn't working, read through the card manufacturer's installation instructions, and recheck all connections, including those to the card, power supply, keyboard, and monitor.

Replacing the Battery

A lithium battery on the motherboard provides backup power for the PC's timekeeping capability. The battery has an estimated life expectancy of seven years.

When the battery starts to weaken, the date and time may be incorrect. If the battery fails, replace it with a CR2032 lithium battery (3 V, 220mAH rating) or an equivalent battery.



WARNING: There is danger of explosion if the battery is incorrectly replaced. Replace only with the same, or equivalent, type of battery. Discard used batteries according to the manufacturer's instructions.

- 1** Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
- 2** Gently lay the PC on its side.
- 3** Remove any cabling, if necessary, to reach the battery.
- 4** To remove the battery, push the latch away from the battery and lift the battery from the socket.
- 5** Install the new CR2032 battery in the socket, with the positive (+) side facing the latch.
- 6** Replace any cabling you removed.
- 7** Set the chassis upright.
- 8** Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

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